IN ARC-I / IN TIG-I Series
Inverter Arc Welding Machines

Operating Manual

WARPP ENGINEERS PVT. LTD.

B-1005, Western Edge II, Western Express Highway,

Near Metro Mall, Borivali (E), Mumbai-400 066.

Tel: 91-22-28542272/ 73/74. Fax: 91-22-28542275.

E-mail:sales@warpp.co.in Web Site: www.warpp.co.in

Thank you for selecting WARPP brand inverter welding machine. In order to keep you safe away from unexpected accidents, and enjoy full benefits offered by our quality products during welding, please read the instruction in details prior to operation. Complying with procedures defined in this manual is always appreciated.

INDEX

Usage & Features

This Series Inverter Arc welding machines include 2 welding combinations: IN ARC (SMAW) & IN TIG (SMAW/TIG) with different specifications of rated current: 400A, 500A, 630A, etc., which are novelty high-efficient and energy-saving DC Arc welders, not only are used in carbon steel and low alloy steel welding, but also used in stainless steel, high alloy steel, copper, silver, molybdenum and titanium welding. As to its sound static and dynamic characteristic and HF arc starting function, the series welders have the following features:

- Invert technology can assured welding current high stability and arc length consistency in fluctuating input primary power. Welding arc enjoys high self-adjustability and mild strength.
- Low spatter
- Easy to start arc
- High deposit efficiency
- the machine can adjust its down- slope time while stopping arc. Weld formation are pretty good.
- With remote control function, welding parameters can be adjusted in extended distance.
- Light, small and portable.
- High power factor, high efficient and energy saving

Safety Precautions

⚠ **General safety precaution:**

- Please strictly comply with rules defined in this manual to avoid unexpected accidents
- How to connect to power supply, select working area and use pressure gas, please comply with proper rules
- Not allow non-operator to enter working area
- Welders' installation, inspection, maintenance, and manipulation must be completed by authorized person.
- Don't use welding machine for unrelated purposes (Such as recharging, heating or pipeline thaw, etc.)
- Must take safe precaution in case welder falling when it is put on the uneven ground

⚠ **Avoid being electric shocked and burnt**

- Never touch on the hot electrical units.
- Please instruct the authorized electrician to ground the welder frame by using

proper-sized copper wire.

- Please instruct the authorized electrician to connect the welder to power supply by using proper- sized, well-insulated copper wire.
- When operating in the damp, space limited area, must ensure well-insulated between body and work piece
- When operating in the high-rising location, must ensure safety by using safe net.
- Please power off the input voltage while no longer using.

⚠ Avoid breathing in hazardous welding fume or gas

- Please use specified ventilation to prevent being gas poisoned and asphyxiated
- Especially in the container where oxygen is depleted easily

⚠ Avoid being harmed by arc flash, hot spatter and slag

- Arc rays can injure your eyes and make your eyes feel uncomfortable.
- Hot spatter and slag can burn your skin. Please wear proper welding helmet, leather gloves, long- sleeved suit, cap, apron and boot before welding.

⚠ Preventing from fire, explosion, container break accidents

- Don’t put flammable material in the working area. Hot spatter and hot weld can easily start a fire.
- Cable must be connected the work piece firmly to ensure good conductivity in case causing fire by resistance heat.
- Don’t weld in the flammable gas or weld container which contains flammable material, otherwise it can cause explode.
- Don’t weld encapsulated container, otherwise it can cause break.
- Ensuring a fire extinguisher at hand in case fire break out.

⚠ Avoid being hurt by moving parts.

- Never let the finger, hair, and cloth near the rotary cooling fan and wire feeder rollers.
- When feeding wire, don’t let the bottom of gun near your eyes, face and body, to prevent being harmed by wire.

⚠ Avoid gas bottle falling or gas regulator breaking

- Gas bottle must be firmly fixed on the ground, else if injure will exerts on.
- Never place bottle under high temperature or straight sun light.
- Never let your face near gas outlet while turning on the gas valve to prevent from being hurt by pressure gas.
- Customer should use the gas regulator provided by our company, and comply with the proper instruction.

⚠ Avoid being hurt by welding machine while in transport

- When moving the welding machine by fork-lift truck or crane, nobody can be allowed for standing downright the route of the moving welder, in case being hurt by the falling welding machine.
- The ropes or wires which used for hanging up the welding machine must be strong enough to withstand corresponding tension strength. The rope or wire inclination hanging on the tackle must be no more than 30°

Installation

1. Installing situation

1. Must place welding machine in the room where is no straight sunlight, no rain, less dust, low humidity ,and temperature range of -10℃～+40℃
2. The gradient of ground must be no more than 15°
3. Ensure no wind at the welding position, or use screen to block the wind.
4. The distance between welder and wall must be more than 20cm, between welders more than 10cm to ensure enough heat radiation.
5. When using water cooled gun, must be care of not being frozen.

2. Requirement of input volt:

(1) Input volt must be standard sine wave, effective value 380V±10%, frequency 50Hz/60Hz

(2) Unbalance degree of 3- phase volt must be no more than 5%

(3) Power supply:

- The size of fuse and breaker in the table are for reference only.

Product type		400	500	630
Power supply		3 phase AC380V		
Min. power capacity		28KVA	38KVA	51KVA
Input protection	Fuse	50A	63A	63A
	breaker	63A	100A	100A
Min. Cable size	Input side	4mm^2	6mm^2	6mm^2
	Output side	50mm^2	50mm^2	70mm^2
	Earth lead	4mm^2	6mm^2	6mm^2

3. Installation

The machines are portably designed, can be effortlessly moved by operators without fix-up. But it should be settled in even and dry places with well ventilation.

3.1 SMAW mode

(1) Ensure firmly connection to welding cable.
(2) Connect to remote controller(If needed)
(3) Adjust every knobs, and switches on the front panel to proper position in line with selected mode.
(4) Turn on the air switch on the power source.
(5) Connect input 3 phase primary power cable to switch box.

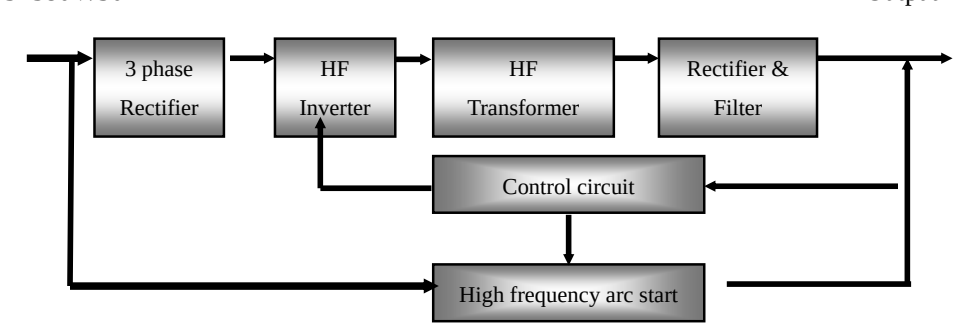
3.2 TIG mode

(1) Ensure firmly connection to welding cable and TIG torch.
(2) Ensure firmly connection to gas hose and gas bottle and or water hose and water supply as to using water-cooled welding torch.
(3) Connect to remote controller(If needed)
(4) Adjust every knobs, and switches on the front panel to proper position in line with selected mode.
(5) Turn on air switch on the power source.
(6) Connect input 3 phase power cable to switch box and close it.

Attention: Before you plug the welding cable, please turn off the power and rightly calibrate the plug key to the socket slot at first, then insert and turn the plug clockwise until it firmly seated. Make sure the plug and the socket are well-connected to be sound conductivity in case that they are burnt out by over resistance heat.

Principle in Brief

Block diagram of principle



3. Installation

The machines are portably designed, can be effortlessly moved by operators without fix-up. But it should be settled in even and dry places with well ventilation.

3.1 SMAW mode

(1) Ensure firmly connection to welding cable.
(2) Connect to remote controller(If needed)
(3) Adjust every knobs, and switches on the front panel to proper position in line with selected mode.
(4) Turn on the air switch on the power source.
(5) Connect input 3 phase primary power cable to switch box.

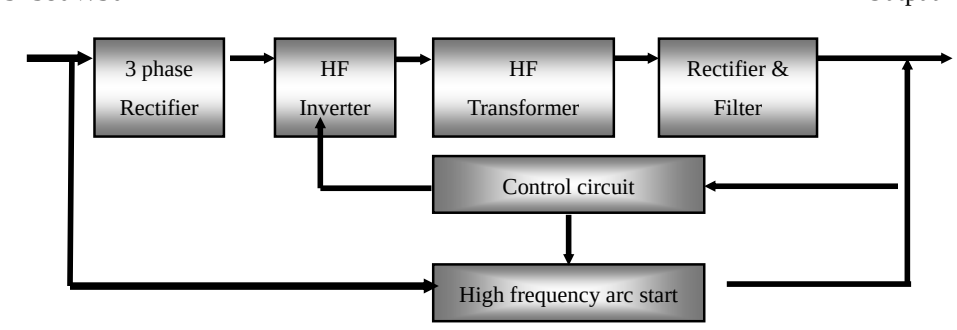
3.2 TIG mode

(1) Ensure firmly connection to welding cable and TIG torch.
(2) Ensure firmly connection to gas hose and gas bottle and or water hose and water supply as to using water-cooled welding torch.
(3) Connect to remote controller(If needed)
(4) Adjust every knobs, and switches on the front panel to proper position in line with selected mode.
(5) Turn on air switch on the power source.
(6) Connect input 3 phase power cable to switch box and close it.

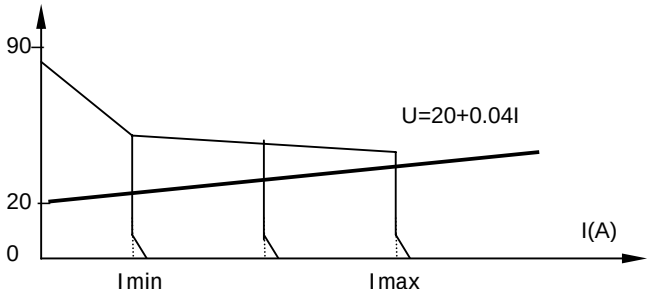
Attention: Before you plug the welding cable, please turn off the power and rightly calibrate the plug key to the socket slot at first, then insert and turn the plug clockwise until it firmly seated. Make sure the plug and the socket are well-connected to be sound conductivity in case that they are burnt out by over resistance heat.

Principle in Brief

Block diagram of principle

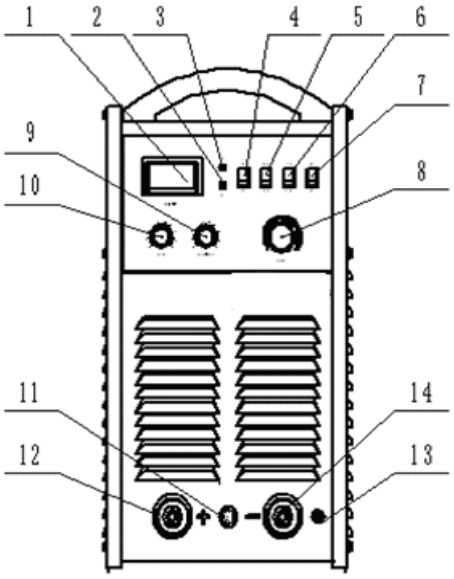


This series welding machines apply IGBT soft switch inverter technology. 3- phase input volt are rectified by rectifier, inverted into HF AC, reduced by HF transformer, rectified and filtered by HF rectifier, then output DC power suitable for welding. After this process, the welder's dynamical responsive speed has been greatly increased, so the welder size and weight are reduced noticeably result in energy saving. Power source enjoy sound anti-fluctuating ability and high-quality performance during external context changes (As to fluctuation in input power supply and extended welding cables).Easy to arc start, stable arc length, pretty weld formation and capability of continuous regulation the current of welding, arc-starting, arc force and time of down-slope as well as remote control availability add significant values to customers. They can also perform down-slope, pre-gas flow and post-gas flow function due to reasonable logic circuit design.
IN ARC Series arc welding machines output characteristic curve is as follows:



Operating Instruction

1. Functional introduction



1.1 Front panel illustration and parts number reference

(1) “Amp/volt” meter

When meter mode switch indicates to “Amp”, the meter displays preset value while in open load, and display practical value of welding current while in actual working. To “Volt”, display practical value while in welding.

(2) “Protection” indicator lamp

Welding machine will automatically stop working when it is overheat, and the lamp will be light on.

(3) “Power” indicator lamp

Lamp indicating whether power source is effectively connected to power supply

(4) “Amp/Volt” meter mode switch

(5)”SMAW/TIG” Switch (Only in IN TIG Series).

When it is indicated to “SMAW”, the machine is to work on SMAW;

When it is on “TIG”, the machine is to work on TIG

4-step/ 2-step switch (Only in IN TIG Series).

(6) “Remote/ Panel control” switch ((200 series only equipped with Panel control)

When it is on “Panel control”, you can adjust current of welding, arc force or down-slope time through the knobs and switches on the panel; when it is on “Remote control’, you can adjust the above parameters through remote control box in a extended distance from the welding areas

(8) “Welding current” regulation knob

Used to adjust welding current on panel control mode

(9) “Arc force current/ down-slope time” regulation knob

Used to adjust arc force current under SMAW or stop-arc time under TIG

(10) “Arc-starting current “regulation knob used to adjust arc starting current.

(11) “Remote control/ TIG” cable socket

It is used to connect with remote control cable to adjust welding current, arc force current or down-slope time through remote control box when it is on the “Remote control” mode, used to weld in extended distance.

To weld in normal distance on TIG, it is used to connect TIG torch's control cable directly.

(12)Welding cable (+) quick plug socket

It is used to connect with stick holder on SMAW mode. Connect to work leads on TIG mode.

(13)Gas outlet (S series not equipped with it)

Connect to TIG torch gas hose.

(14)Welding cable (-) quick plug socket

It is connected to work lead on SMAW mode and connected to TIG torch welding cable on TIG mode.

(11) “Remote control/ TIG” cable socket

It is used to connect with remote control cable to adjust welding current, arc force current or down-slope time through remote control box when it is on the “Remote control” mode, used to weld in extended distance.

To weld in normal distance on TIG, it is used to connect TIG torch's control cable directly.

(12)Welding cable (+) quick plug socket

It is used to connect with stick holder on SMAW mode. Connect to work leads on TIG mode.

(13)Gas outlet (S series not equipped with it)

Connect to TIG torch gas hose.

(14)Welding cable (-) quick plug socket

It is connected to work lead on SMAW mode and connected to TIG torch welding cable on TIG mode.

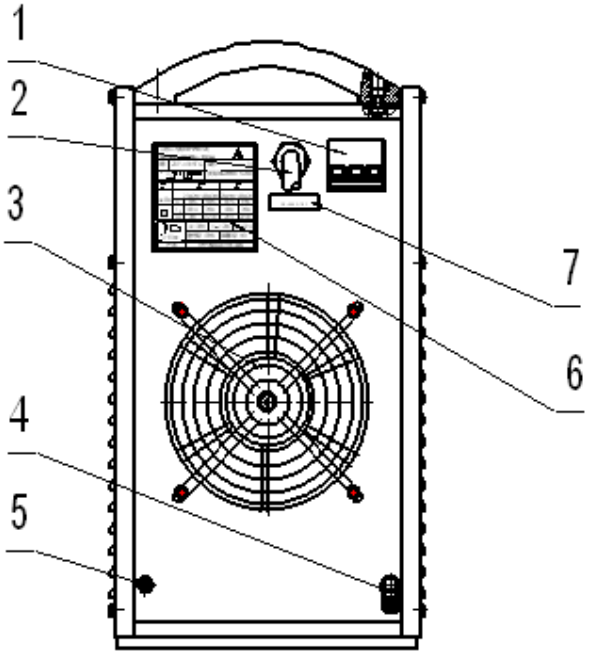
1.2 The rear panel and parts number reference

(1) Air switch

The function of air switch is to protect welding machine by automatic trip to turn-off power supply while in machine overload or failure. Normally, the switch flipped to upward means power-on. Use switch on the switch box to start or stop welding machine, avoiding using the breaker.

(2) Input power cable

It is 4-pin cable. The mixed-colored wire must be firmly grounded, the rest wires connect to corresponding 3-phase power supply (380v/50Hz).



2.1.1 Shift between two working styles:

(1) Shift from down-slope to non-down-slope

Switch to “TIG” mode, pull TIG torch trigger, then loose it, open load voltage of power source will disappear to indicate working style being shifted to non-down-slope.

(2) Shift from non-down-slope to down-slope

Switch to “SMAW” mode from “TIG”, then back to “TIG” to complete shift.

2.1.2 Scratch arc-start with down-slope working style

Reference to 2.2.2 operation procedure

2.1.3 Scratch arc-start with non-down-slope working style

Reference to 2.2.3 operation procedure

2.2 **Working styles on TIG mode of type STG series**

Can be divided into 2 working styles: scratch arc-start and high frequency arc-start.

2.2.1 Shift between two working styles:

Shift scratch arc-start to high frequency arc-start

(1)Switch to “TIG” mode, then pull TIG torch trigger, then loose it, open load voltage of power source will disappear to indicate working style is shifted to HF arc-start.

(2)Shift HF arc-start to scratch arc-start

Switch to “SMAW” mode from “TIG”, then back to “TIG” to complete shift.

2.2.2 High frequency arc-start

Procedure flow sheet shows below :(Next page)

Repair and Maintenance

In principle, welders’ maintenance and repair should be completed by us or our authorized distributors. Customers can also solve the problems instructed by us or our authorized distributors.

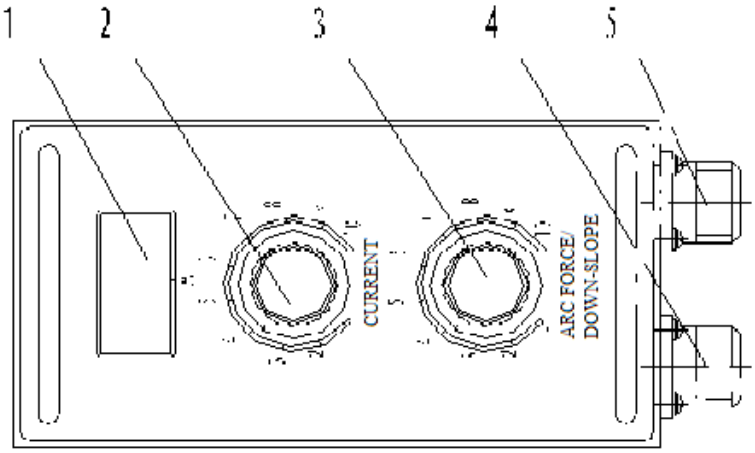
1. Attention:

(1) Rivet equipment name tag on the specified area of the case, otherwise the inside parts will be damaged.

(2) Connect welding cable to terminal lug firmly, otherwise the terminal lug will be burn out which will lead to welding process instability.

(3) Prevent jointer of welding cable and terminal lug from contacting with other metals on the ground to avoid short circuit.

(4) Operating carefully not to make welding and control cable to be worn out or



(1) "Amp" meter

It displays preset value while in open load, and displays practical value of welding current while in actual working.

(2) "Welding current" regulation knob

(3) "Arc force current/ down-slope" regulation knob

(4) Socket 1

Connect to remote control cable.

(5) Socket 2

Connect to welding torch control cable which has a plug. There are 2 control wires welded to lug 1 and lug 2 respectively on the plug

2. **Operating instruction**

Turn on the air switch on the switch box, the "Normal" indication lamp will light on and cooling fan rotate. Before welding normally, set up parameters by adjusting knobs and switches on the control box and front panel according to the selected mode. Customer should refer to parameters defined in table 1 and table 2 showing below:

Table 1 SMAW welding parameters

Work piece thickness (mm)	< 1	2	3	4 ~ 5	6 ~ 12	≥13
Electrode diameter (mm)	1.5	2	3.2	3.2 ~ 4	4 ~ 5	5 ~ 6
Welding current (A)	20 ~ 40	40 ~ 50	90 ~ 110	90 ~ 130	160 ~ 250	250 ~ 400

Table 2 TIG welding parameters

Work piece thickness（mm）	Welding current （A）	Tungsten electrode diameter（mm）	Max Argon gas flow rate（L/min）
1～3	40～50 50～80	1～2	4 6
3～6	80～120 120～160 160～200 200～300	2～4	7 8 9 10
6～9	300～400	4～6	12

Attention: On SMAW, when welding current is low and cable length of stick holder is short(no more than 40m), arc force current should be adjusted in the range of 1-7 . As to large welding current and long cable of stick holder, where volt potential difference is very high between the two ends of cable, arc force current should be adjusted in the range of 7- 10.

2.1 **Working styles on TIG mode of ST series**

Can be divided into 2 working styles: scratch arc-start with down-slope and scratch arc-start without down-slope.

2.1.1 Shift between two working styles:

(1) Shift from down-slope to non-down-slope

Switch to “TIG” mode, pull TIG torch trigger, then loose it, open load voltage of power source will disappear to indicate working style being shifted to non-down-slope.

(2) Shift from non-down-slope to down-slope

Switch to “SMAW” mode from “TIG”, then back to “TIG” to complete shift.

2.1.2 Scratch arc-start with down-slope working style

Reference to 2.2.2 operation procedure

2.1.3 Scratch arc-start with non-down-slope working style

Reference to 2.2.3 operation procedure

2.2 **Working styles on TIG mode of type STG series**

Can be divided into 2 working styles: scratch arc-start and high frequency arc-start.

2.2.1 Shift between two working styles:

Shift scratch arc-start to high frequency arc-start

(1)Switch to “TIG” mode, then pull TIG torch trigger, then loose it, open load voltage of power source will disappear to indicate working style is shifted to HF arc-start.

(2)Shift HF arc-start to scratch arc-start

Switch to “SMAW” mode from “TIG”, then back to “TIG” to complete shift.

2.2.2 High frequency arc-start

Procedure flow sheet shows below :(Next page)

Repair and Maintenance

In principle, welders’ maintenance and repair should be completed by us or our authorized distributors. Customers can also solve the problems instructed by us or our authorized distributors.

1. Attention:

(1) Rivet equipment name tag on the specified area of the case, otherwise the inside parts will be damaged.

(2) Connect welding cable to terminal lug firmly, otherwise the terminal lug will be burn out which will lead to welding process instability.

(3) Prevent jointer of welding cable and terminal lug from contacting with other metals on the ground to avoid short circuit.

(4) Operating carefully not to make welding and control cable to be worn out or Broken

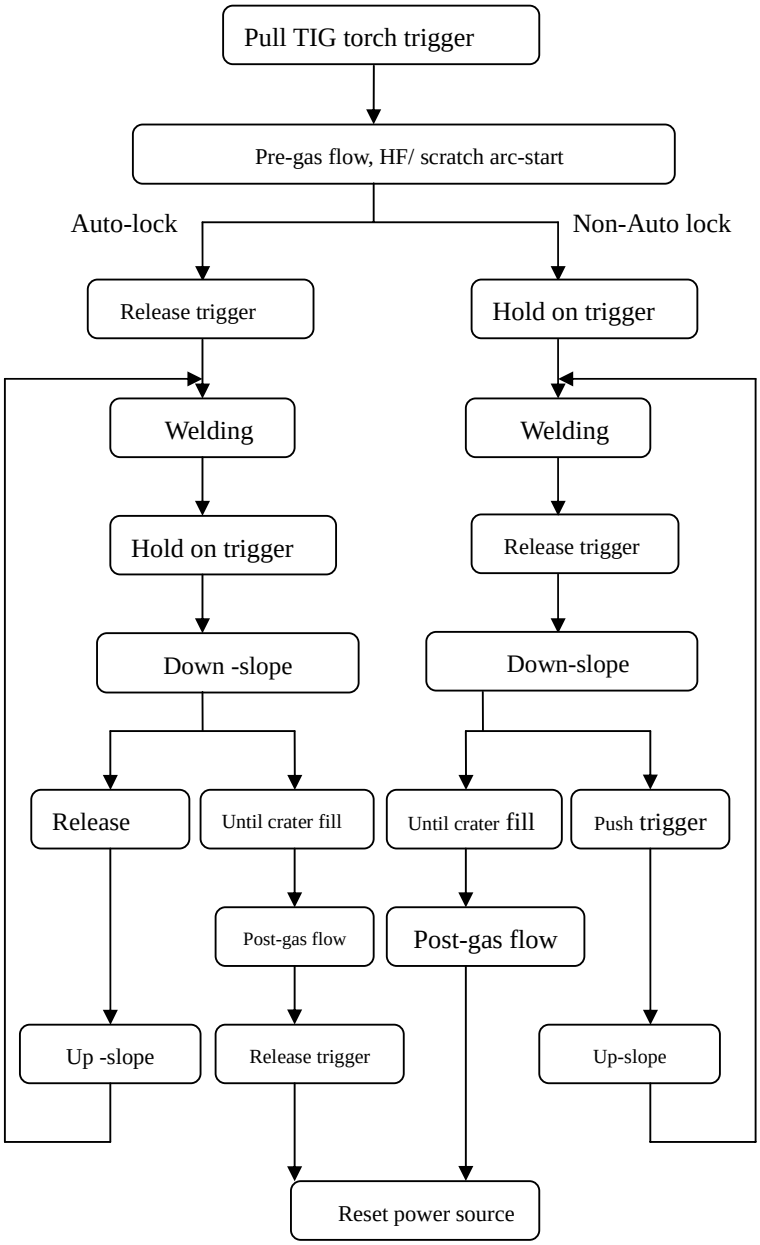


Fig. HF arc-start procedure flow sheet

(5) Never let welding machine be bumped into or stacked up by heavy objects.

(6) Ensure good ventilation

(7) Temperature of cooling water is no more than 30 and no less than 0 . The water must be clean without impurity for fear of blocking water circulation which will result in torch damage.

The machines can halt automatically, when work with large current for a long time. Overheat protection lamp will light on. The machines will recovery after running up several minutes in open load.

(8) If the air switch on rear panel trips when the machine has worked with large current for a long time, operator should power off the switch, then start the machine in 5 minutes. Remember before starting the machine, turn on the air switch on the rear panel, power on the switch box. The machine will be ready after running under open load for several minutes.

(9) Be sure to turn off argon and water as well as power source when finish welding.

2. Periodic inspection and maintenance

(1) Removes dust from power resource with pressure air by authorized maintainer every 3-6 months. Check if the bolt is loose.

(2) Check frequently if control cables are worn out, adjusting knobs are loose, and components of panel are damaged.

(3) Check output cable periodically, if jointers are loose or plugs are distortion, please repair in time, otherwise the sockets will burn out.

(4) Clear up or change contact tips and tungsten electrodes timely.

3. **Trouble shooting**

3.1. Checking procedure prior to maintenance

(1) Check if the panel switches and potentiometers are on the proper position

(2) Check if the input volt has phase missing, and range are between 340-420V.

(3) Check if the input cable connects correctly and firmly with the power source.

(4) Check if the welding cables connect correctly and firmly.

(5) Check if water circulation and CO2 flows out smoothly.

Warning:

Don’t open up case uninstructed, the max volt inside machine is 600V. Take safe precautions to prevent from being electric shocked while in maintenance.

Never discharge high voltage to welder case with welding torch! Shut down power source before changing or repairing welding cable or torch

Technical data

Main technical parameters

Description	Parameters		
	400	500	630
Primary power voltage/frequency	3 phase 380V±10%/50Hz		
Rated output capacity	14.4KW	20KW	27.7KW
Rated input current	28A	38A	52A
Rated duty cycle	60%		
Range of output current	20～400A	20～500A	50～630A
Output voltage of open load	80±8V		
Full-load efficiency	89%		
Power factor（full-load）	0.95		
Welding electrode diameter	2～6mm	2～6mm	2～6mm
Tungsten electrode diameter	1～6mm	1～6mm	1～6mm
Weight	43Kg	47Kg	55Kg
Dimension	636×322×582 mm		576×297×557 mm
Max argon flow rate	25L/min		
Insulation grade	Main transformer		H
	Power source transformer、output reactance		B

- IN ARC / IN TIG-400 I

No.	Tab	Item	Qua.	Memo
1	K1	Air switch	1	
2	D1	3-phase rectifier module	1	Small
3	L1	Polypropylene capacitor	1	
4	C30	Polypropylene capacitor	1	
5	C4	IGBT module	1	
6	M1、M2	Voltage sensitive resistance	2	
7	R1	Ceramic dielectric capacitor	1	
8	C8～C17	Ceramic dielectric capacitor	10	
9	T1	Main transformer	1	
10	T4	Power source transformer	1	
11	T5	Insulation transformer (IN TIG)	1	
12	D1～D4	Fast recovery diode module	2	
13	L2	Current exchange inductor (IN TIG)	1	
14	F1	Fuse size	1	
15	YHB	Arc-start board components (IN TIG)	1	
16	T3	Stray transformer (IN TIG)	1	
17	M	axial airflow fan	1	
18		Switch	4	
19		Digital displayer	1	
20	SW	Thermal relay	1	
21		Potentiometer	1	Current adjustment
22		Potentiometer	2	Force arc-starting adjustment
23		Electromagnet valve (IN TIG)	1	
24		Main control board	1	
25		Driving board	1	

- IN ARC / IN TIG-500 I

No.	Tab	Item	Qua.	Memo
1	K1	Air switch	1	
2	D1	3-phase rectifier module	1	big
3	L1	Polypropylene capacitor	1	
4	C30	Polypropylene capacitor	1	
5	C4～5	IGBT module	2	
6	M1、M2	Voltage sensitive resistance	2	
7	R1	Ceramic dielectric capacitor	1	
8	C8～C19	Ceramic dielectric capacitor	12	
9	T1	Main transformer	1	
10	T4	Power source transformer	1	
11	T5	Insulation transformer (IN TIG)	1	
12	D1～D6	Fast recovery diode module	3	
13	L2	Current exchange inductor (IN TIG)	1	
14	F1	Fuse size	1	
15	YHB	Arc-start board components (IN TIG)	1	
16	T3	Stray transformer (IN TIG)	1	
17	M	axial airflow fan	1	
18		Switch	4	
19		Digital displayer	1	
20	SW	Thermal relay	1	
21		Potentiometer	1	Current adjustment
22		Potentiometer	2	Force arc-starting adjustment
23		Electromagnet valve (IN TIG)	1	
24		Main control board	1	
25		Driving board	1	

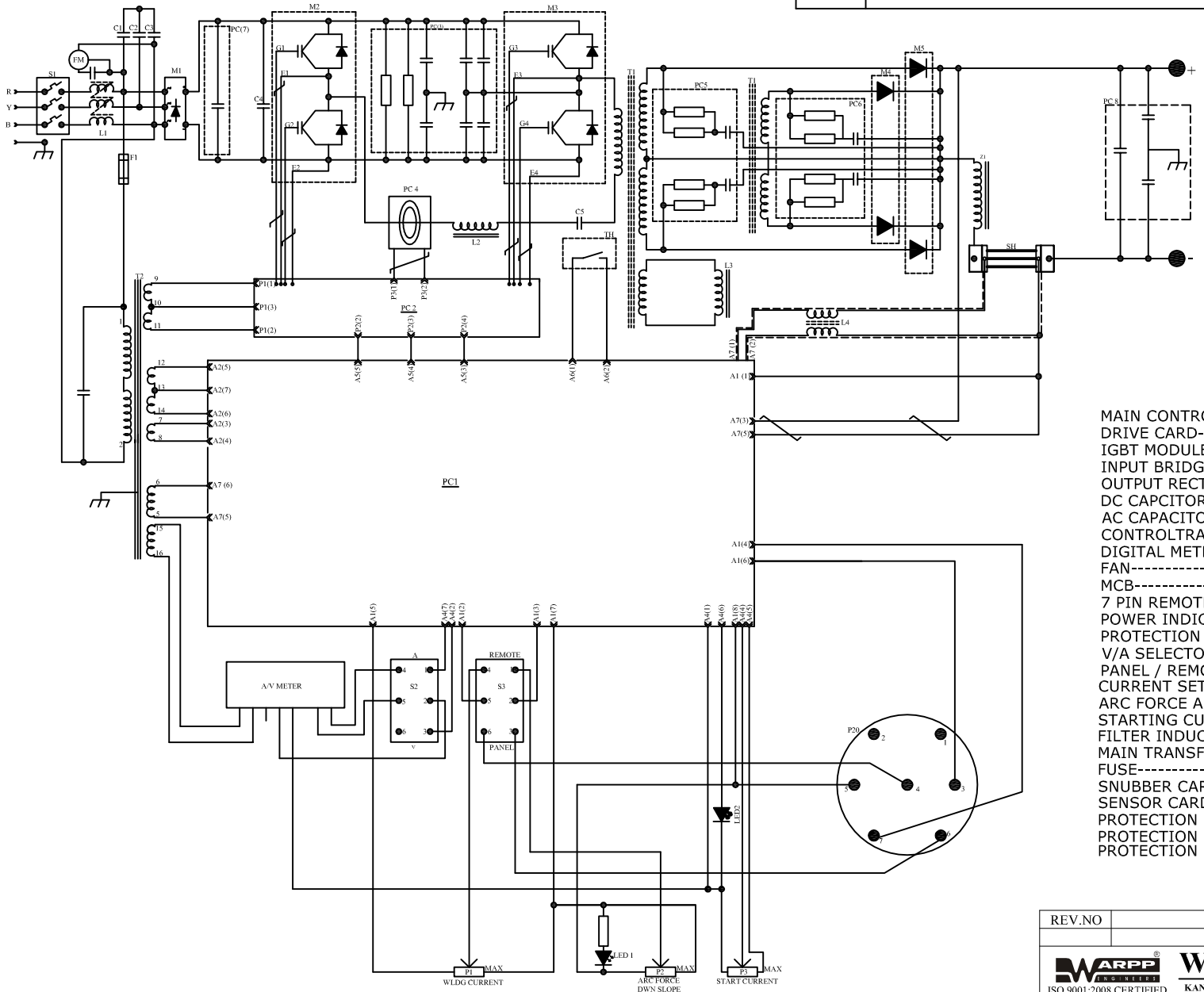
- IN ARC / IN TIG-630 I

No.	Tab	Item	Qua.	Memo
1	K1	Air switch	1	
2	D1	3-phase rectifier module	1	
3	L1	Polypropylene capacitor	1	
4	C30	Polypropylene capacitor	1	
5	C4～5	IGBT module	2	
6	M1、M2	Voltage sensitive resistance	2	
7	R1	Ceramic dielectric capacitor	1	
8	C8]～C21	Ceramic dielectric capacitor	14	
9	T1	Main transformer	1	
10	T3	Power source transformer	1	
11	T5	Insulation transformer (IN TIG)	1	
12	D3～D8	Fast recovery diode module	4	
13	L2	Current exchange inductor (IN TIG)	1	
14	F1	Fuse size	1	
15	YHB	Arc-start board components (IN TIG)	1	
16	T3	Stray transformer (IN TIG)	1	
17	M1	axial airflow fan	1	
18		Switch	4	
19		Digital displayer	1	
20	SW	Thermal relay	1	
21		Potentiometer	1	Current adjustment
22		Potentiometer	2	Force arc-starting adjustment
23		Electromagnet valve (IN TIG)	1	
24		Main control board	1	
24		Driving board	1	

Appendix A: common failures, probable cause & countermeasures

№	Phenomena	Reason	Solving methods
1	After power on, it doesn't work.	Phase missing power source, in Fuse（2A）in welder is broken. Cable is broken	Check power source Check if cooling fan, power source transformer and main control board are good or not. Check connection
2	Air switch on back panel trips while the machine is working normally.	The following components may be damaged: IGBT module, 3-phase rectify module, outputting diode module, or other components, Driving board is damaged. Short circuit between lines.	Check and replace. When IGBT module is damaged, please check 12Ω, 5.1Ω resistance or SR160 on driving board is damaged or not.
3	Welding current is unstable.	Phase missing The following components may be damaged： Potentiometers, switches on front panel and remote control cable, potentiometer on remote controller. Main control board is damaged	Check power source. Check and replace.
4	Welding current is not adjustable.	Potentiometer of welding current adjustment is damaged. Remote control cable is broken. Main control board is damaged The switch on the front panel is damaged	Check and replace.
5	TIG welding is abnormal.	TIG torch switch is damaged. Remote control cable is broken. The tungsten electrode in welder is in the wrong position. Main control board is damaged	Check and replace.

SR.NO.	DESCRIPTION	MATL.	QTY.	WT.EACH	TOTAL WT.	REMARK



MAIN CONTROL CARD----------PC1
DRIVE CARD---------- PC2
IGBT MODULE----------M2,M3
INPUT BRIDGE----------M1
OUTPUT RECTIFIER MODULE ----------M4,M5
DC CAPCITOR----------C4
AC CAPACITOR---------- C5
CONTROLTRANSFORMER----------T2
DIGITAL METER----------A/V
FAN----------FM
MCB----------SI
7 PIN REMOTE----------P20
POWER INDICATOR----------LED 1
PROTECTION INDICATOR---------- LED 2
V/A SELECTOR SWITCH----------S2
PANEL / REMOTE SWITCH----------S3
CURRENT SETTING POT----------P1
ARC FORCE ADJUSTMENT POT ----------P2
STARTING CURRENT ADJUSTMENT POT----------P3
FILTER INDUCTOR (CHOKE)----------Z1
MAIN TRANSFORMER----------T1
FUSE---------- F1
SNUBBER CARD----------PC3
SENSOR CARD----------PC4
PROTECTION CARD (M4/M5)----------PC5,PC6
PROTECTION (M1)----------PC7
PROTECTION (OUTPUT)----------PC8

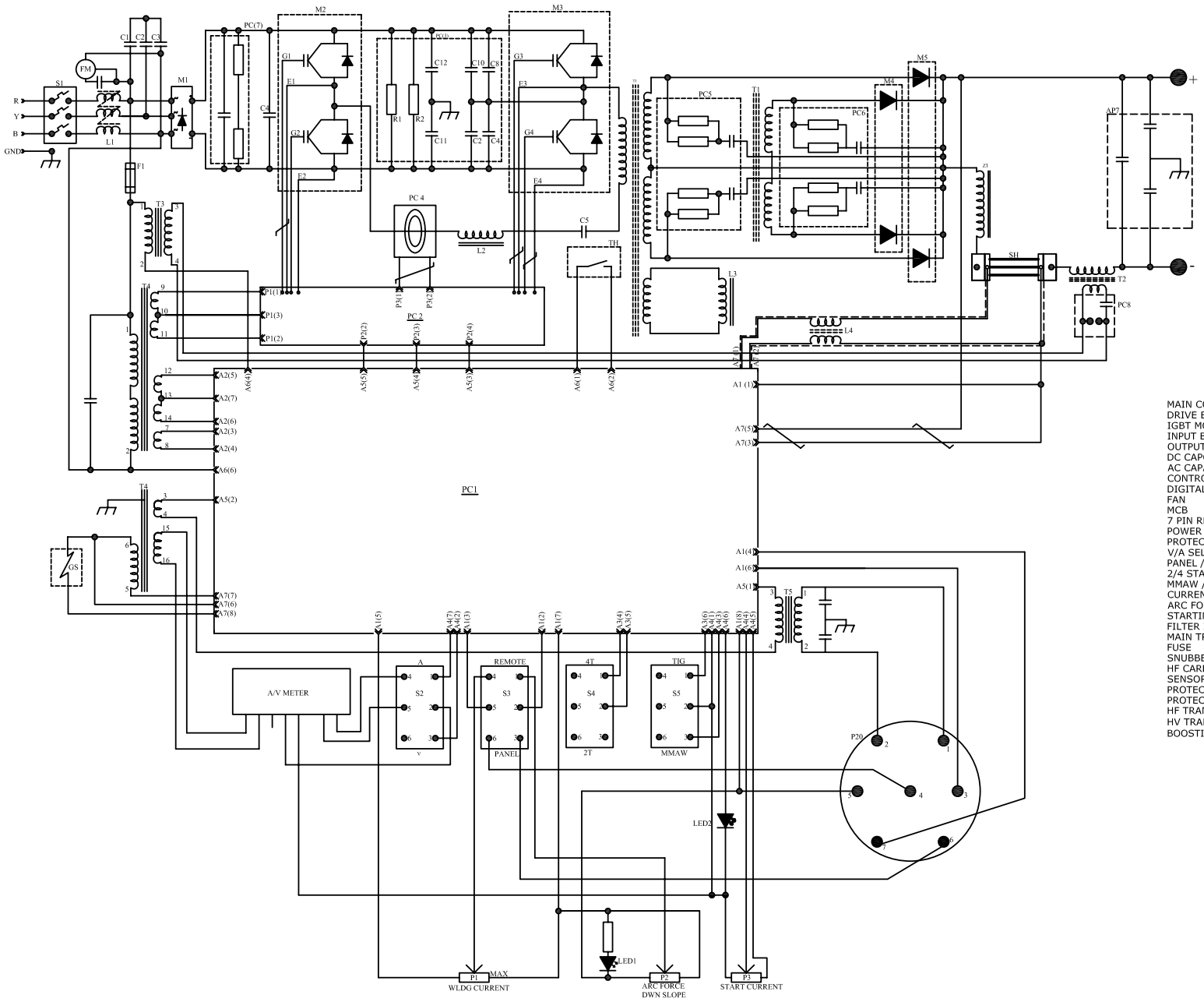
REV.NO	REVISION NOTE	DATE	SIGN.	CHECKED

ISO 9001:2008 CERTIFIED COMPANY

WARPP ENGINEERS PVT.LTD.

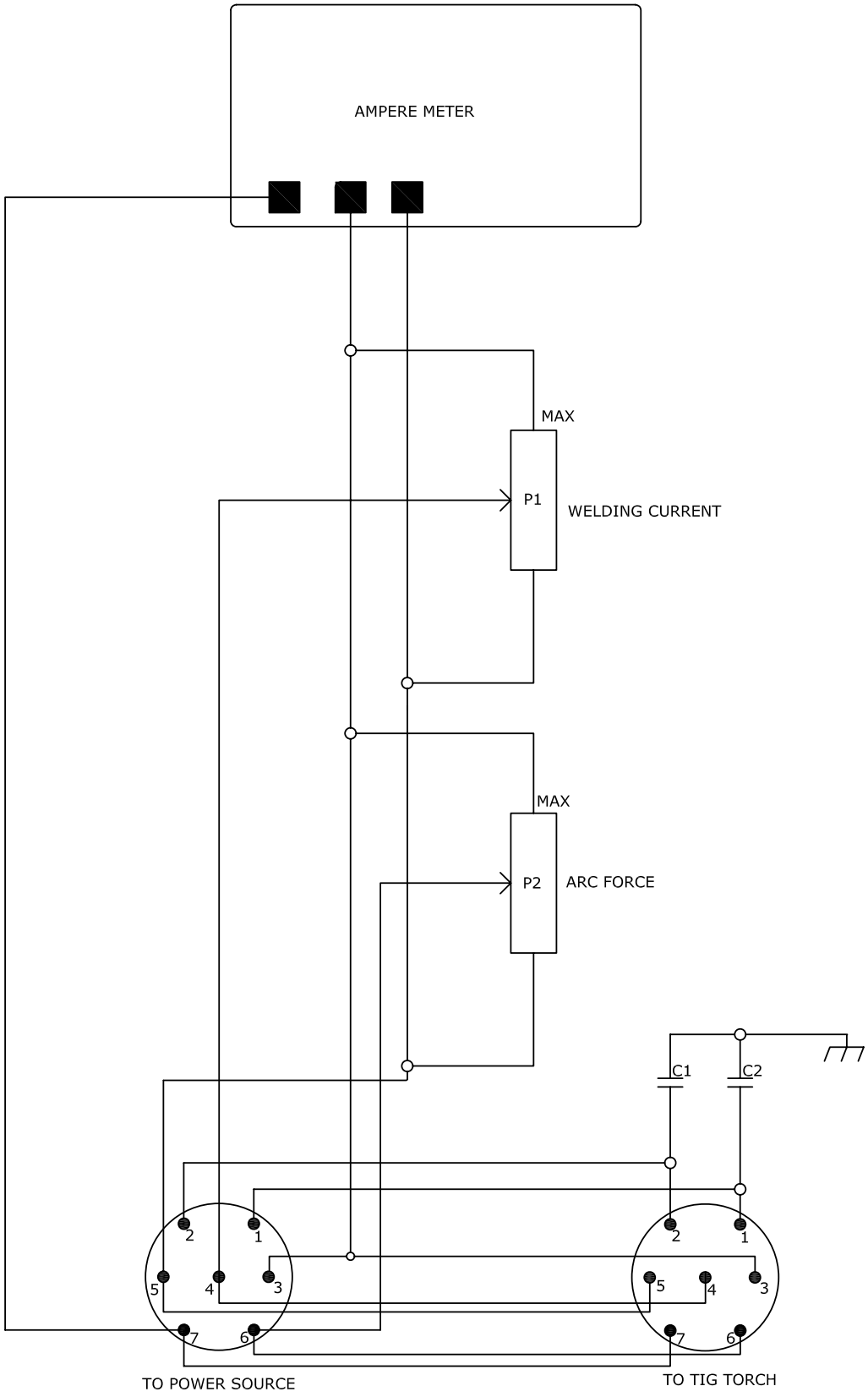
KANDIVLI (W),MUMBAI-4000 67.(INDIA).PHONE:-022 -28687298,29672013/14. FAX:-022- 28687919.
e-mail:-sales@warpp.co.in . Website:-www.warpp.co.in

ALL DIMENSIONS IN mm				DRAWING NAME:- CIRICUIT DIAGRAM		
LINEAR DIMNS.				MACHINE MODEL:- INARC-400 I		
OVER	——	06	30	DRAWN BY / DATE	CHECKED BY / DATE	APPROVED BY / DATE
UPTO	06	30	1000	SHRUTIKA SAWANT DATE:- 26-06-2008	RAMAKANTH BHAGAVATH DATE:- 27-06-2008	PRABHUDAS GOLLA DATE:- 29-06-2008
TOL.	±0.5	±0.75	±1.0			
DRAWING NO:- WEPL-B02 / 01 OUT OF 0001						
REV.NO:- 00				REMARK :-		



MAIN CONTROL BOARD	=PC1
DRIVE BOARD	=PC2
IGBT MODEL	=M2,M3
INPUT BRIDGE	=M1
OUTPUT RECTIFIER MODULE	=M4,M5
DC CAPCITOR	=C4
AC CAPACITOR	=C5
CONTROLTRANSFORMER	=T4
DIGITAL METER	=A/V
FAN	=(FM)
MCB	=SI
7 PIN REMOTE	=P20
POWER INDICATOR	=LED 1
PROTECTION	=LED 2
V/A SELECTOR SWITCH	=S2
PANEL / REMOTE SWITCH	=S3
2/4 STAP SWITCH	=S4
MMAW / TIG SWITCH	=S5
CURRENT SETTING POT 4.7K 3W	=P1
ARC FORCE / DOWN SLOP ADJUSTMENT POT 4.7K2W	=P2
STARTING CURRENT ADJUSTMENT POT	=P3
FILTER INDUCTOR (CHOKE)	=Z1
MAIN TRANSFORMER	=T1
FUSE	=F1
SNUBBER CARD	=PC3
HF CARD	=PC8
SENSOR CARD	=PC4
PROTECTION CARD (M4/M5)	=PC5,PC6
PROTECTION CARD (M1)	=PC7
HF TRANSFORMER	=T2
HV TRANSFORMER	=T3
BOOSTING TRANSFORMER	=T5

CIRCUIT DIAGRAM FOR INTIG 400 I



REMOTE FOR INTIG-400 I

Front Panel of ARC series

Power on LED (LED1)

Protection on LED (LED2)

Digital Display (DSP001)

Remote / Panel Control Switch (KD1)

Arc-starting Current Potentiometer (W3)

Amp / Volt Switch (KD2)

Arc-force Current / Down-slope Time Potentiometer (W2)

Welding Current Potentiometer (W1)

Control Socket (P20)

Output Terminal (+) (OUTP)

Output Terminal (-) (OUTN)

Front Panel

VOLTAGE/AMPERE SWITCH (PSW01)

SMAW/TIG SELECTION SWITCH (PSW01)

LED YELLOW (LED Y01)

2 / 4 TRACK SELECTION SWITCH (PSW01)

Digital Display Meter (DSP001)

REMOTE/PANEL SELECTION SWITCH (PSW01)

LED RED (LED R01)

POTENTIOMETER FOR CURRENT (POT001)

POTENTIOMETER FOR STRIKING CURRENT (POT001)

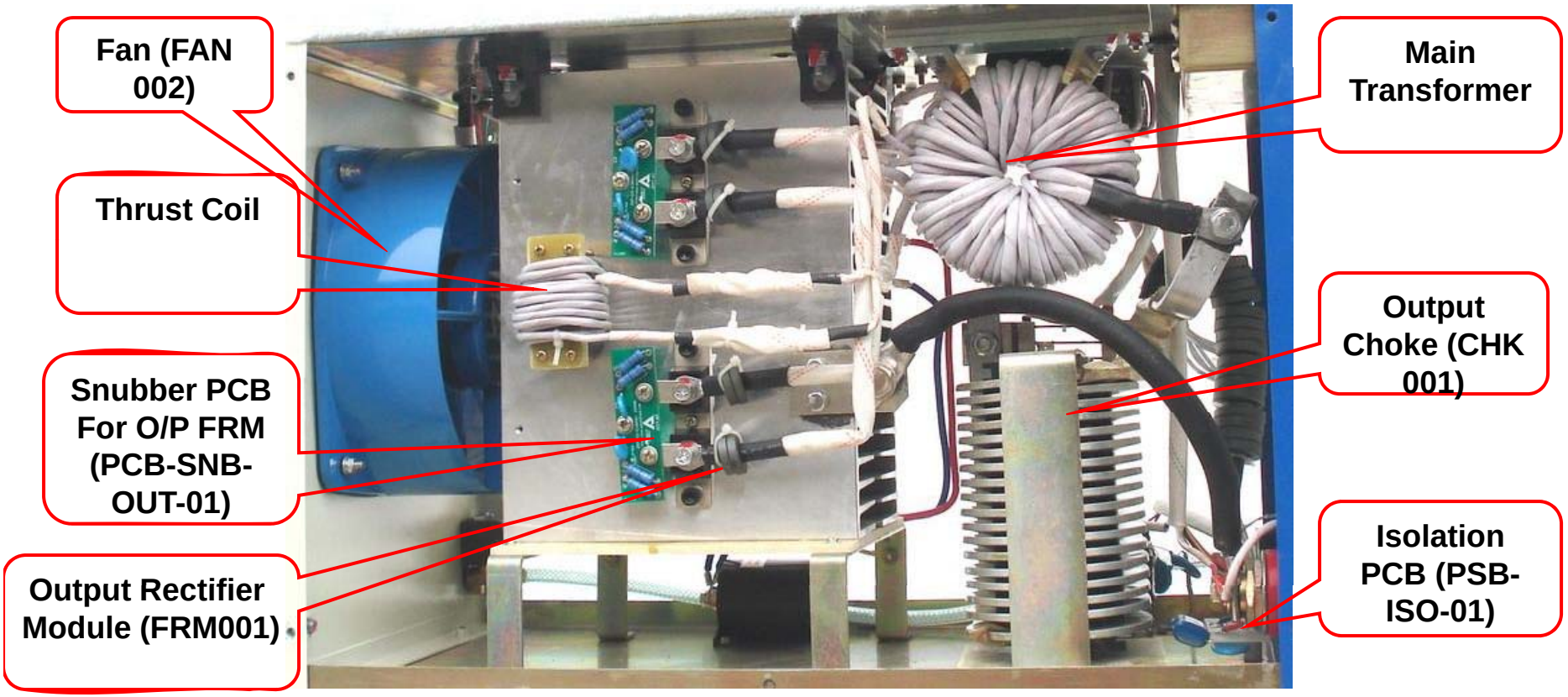
POTENTIONMETER FOR ARC FORCE (POT001)

Output Terminal (+) (OUTP)

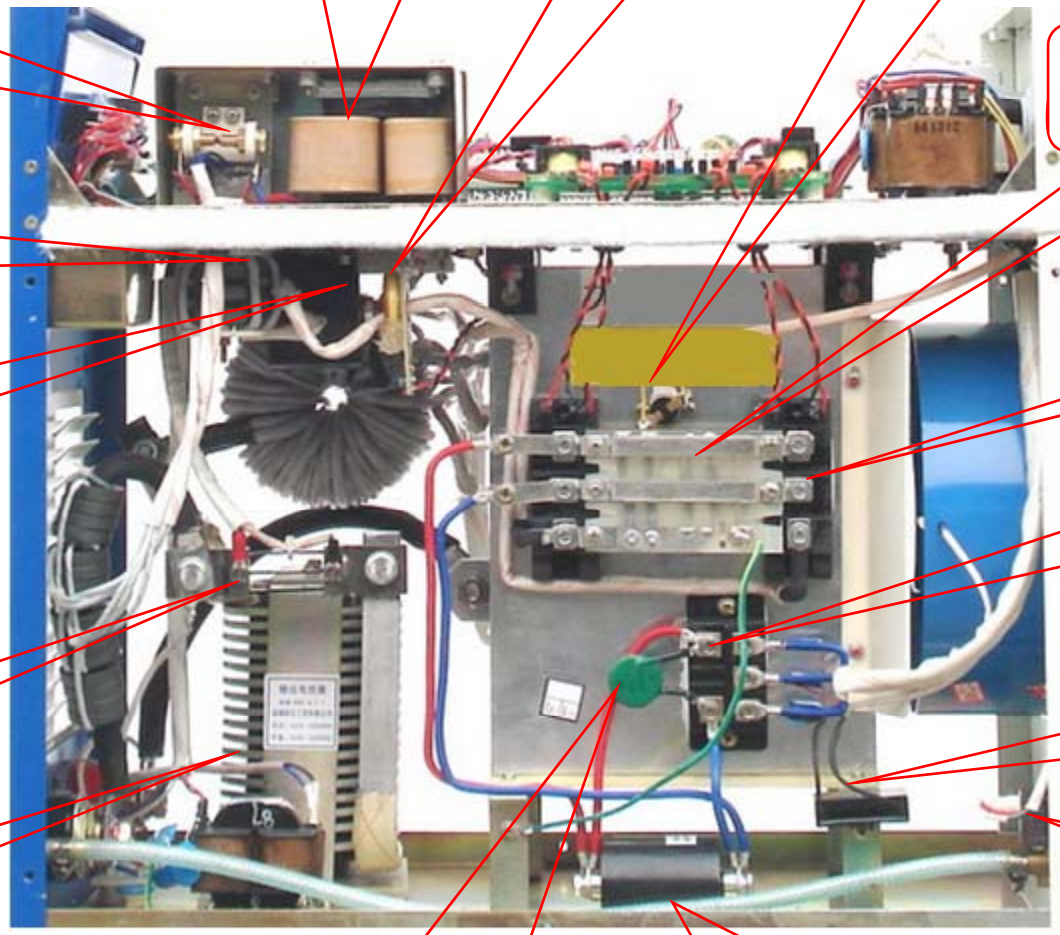
7 PIN CONNECTOR MALE (CON7PNM)

OUTPUT TERMINAL (-) (OUTN)

Left View


Fan (FAN 002)
Thrust Coil
Snubber PCB For O/P FRM (PCB-SNB-OUT-01)
Output Rectifier Module (FRM001)
Main Transformer
Output Choke (CHK 001)
Isolation PCB (PSB-ISO-01)

Right View



HF PCB (PCB-HF-01)

HF Transformer (CTRAX007)

Over Current Protection PCB

Thermal Cut-Out

SNUBBER CARD

Resonant Coil

IGBT

AC Capacitor

Input Bridge Module

Shunt

Fan Capacitor (CAP05)

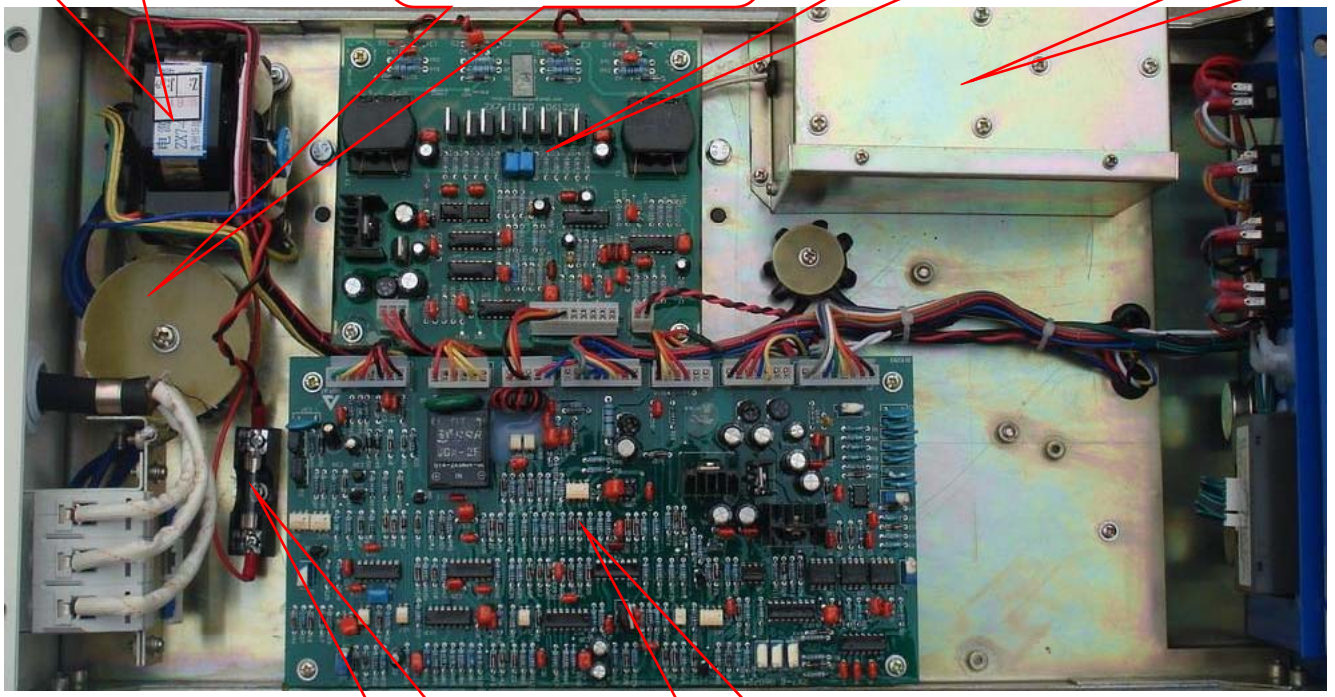
Insulation Transformer (INSTRX001)

MOV (MOV001)

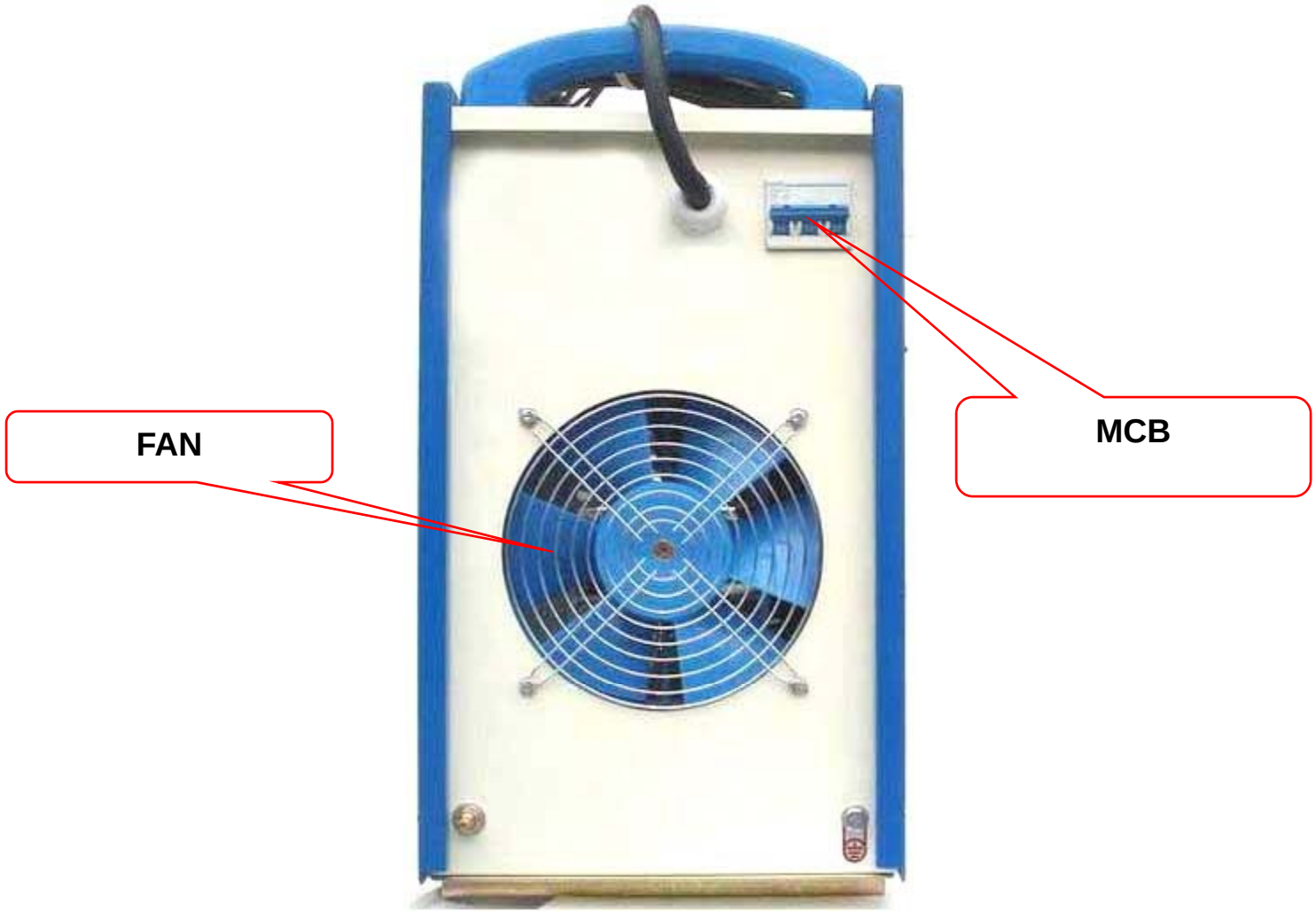
DC Capacitor (CAP001)

Solonaid Valve (SV001)

Top View


CONTROL TRANSFORMER (CTRAX001)
Input Surge Suppressor (ISS 01)
Drive CARD (PCB-DRV-01)
Fuse (F1)
Main PCB

Rear Panel



List for the spares of INTIG I Series machines				
DESCRIPTION	**INTIG-315**	**INTIG-400 I**	**INTIG-500 I**	**INTIG-630 I**
	Part Code	**Part Code**	**Part Code**	**Part Code**
MAIN PCB	PCB-TIG-315I	PCB-TIG-400I	PCB-500I	PCB-TIG-630I
DRIVE CARD	PCB-DRV-01	PCB-DRV-01	PCB-DRV-01L	PCB-DRV-01L
IGBT	IGBT7512	IGBT7512	IGBT10012	IGBT15012
INPUT BRIDGE MODULE	IBDG003	IBDG003	IBDG004	IBDG004
OUTPUT RECTIFIER MODULE	FRM001	FRM001	FRM001	FRM001
FAN	FAN002	FAN002	FAN003	FAN003
DC CAPACITOR	CAP001	CAP001	CAP001	CAP001
AC CAPACITOR	CAP002	CAP003	CAP003	CAP04
SNUBBER CARD	PCB-SNB-01	PCB-SNB-01	PCB-SNB-02	PCB-SNB-02
MCB	MCB001	MCB001	MCB002	MCB003
DIGITAL DISPLAY METER	DSP001	DSP001	DSP001	DSP001
INPUT SURGE SUPPRESSOR	ISS001	ISS001	ISS001	ISS001
SNUBBER CAPACITOR	SCAP001	SCAP001	SCAP001	SCAP001
CONTROL TRANSFORMER	CTRAX001	CTRAX001	CTRAX001	CTRAX001
OUTPUT CHOKE	CHK001	CHK001	CHK001	CHK001
HF PCB	PCB-HF-01	PCB-HF-01	PCB-HF-01	PCB-HF-01
HF PCB CAPACITOR	PCB22.01	PCB22.01	PCB22.01	PCB22.01
SOLONAID VALVE	SV001	SV001	SV001	SV001
INSULATION TRANSFORMER	INSTRX001	INSTRX001	INSTRX001	INSTRX001
MOV	MOV001	MOV001	MOV001	MOV001
ISOLATION PCB	PCB-ISO-01	PCB-ISO-01	PCB-ISO-01	PCB-ISO-01
SNUBBER PCB FOR OUTPUT FRM	PCB-SNB-OUT-01	PCB-SNB-OUT-01	PCB-SNB-OUT-01	PCB-SNB-OUT-01
POTENTIOMETER FOR	POT001	POT001	POT001	POT001
KNOB FOR THE POT	KNOB001	KNOB001	KNOB001	KNOB001
OVERCURRENT PROTECTION PCB	PCB-OC-315	PCB-OC-400	PCB-OC-500	PCB-OC-630
MAIN TRANSFORMER	MTRX001	MTRX002	MTRX003	MTRX004
FAN CAPACITOR	CAP05	CAP05	CAP05	CAP05
TWO POLE SWITCH FOR	PSW001	PSW001	PSW001	PSW001
OUT PUT CONNECTOR MACHINE SIDE	FST-PLG-F-01	FST-PLG-F-01	OUT-CON-01	OUT-CON-01
OUT PUT CONNECTOR CABLE SIDE	FST-PLG-M-01	FST-PLG-M-01	NA	NA
7 PIN CONNECTOR MALE	CON7PNM	CON7PNM	CON7PNM	CON7PNM
SHUNT	SHUNT001	SHUNT001	SHUNT002	SHUNT002
LED RED	LEDR01	LEDR01	LEDR01	LEDR01
LED YELLOW	LEDY01	LEDY01	LEDY01	LEDY01

DESCRIPTION	INARC-315	INARC-400 I	INARC-500 I	INARC-630 I
	Part Code	Part Code	Part Code	Part Code
MAIN PCB	PCB-ARC-315I	PCB-ARC-400I	PCB-ARC-500I	PCB-ARC-630I
DRIVE CARD	PCB-DRV-01	PCB-DRV-01	PCB-DRV-01L	PCB-DRV-01L
IGBT	IGBT7512	IGBT7512	IGBT10012	IGBT15012
INPUT BRIDGE MODULE	IBDG003	IBDG003	IBDG004	IBDG004
OUTPUT RECTIFIER MODULE	FRM001	FRM001	FRM001	FRM001
FAN	FAN002	FAN002	FAN003	FAN003
DC CAPACITOR	CAP001	CAP001	CAP001	CAP001
AC CAPACITOR	CAP002	CAP003	CAP003	CAP004
SNUBBER CARD	PCB-SNB-01	PCB-SNB-01	PCB-SNB-02	PCB-SNB-02
MCB	MCB001	MCB001	MCB002	MCB003
DIGITAL DISPLAY METER	DSP001	DSP001	DSP001	DSP001
INPUT SURGE SUPPRESSOR	ISS001	ISS001	ISS001	ISS001
SNUBBER CAPACITOR	SCAP001	SCAP001	SCAP001	SCAP001
CONTROL TRANSFORMER	CTRAX001	CTRAX001	CTRAX001	CTRAX001
MOV	MOV001	MOV001	MOV001	MOV001
ISOLATION PCB	PCB-ISO-01	PCB-ISO-01	PCB-ISO-01	PCB-ISO-01
SNUBBER PCB FOR OUTPUT FRM	PCB-SNB-OUT-01	PCB-SNB-OUT01	PCB-SNB-OUT-02	PCB-SNB-OUT-02
POTENTIOMETER FOR CURRENT/STRIKING CURRENT/ARC FORCE	POT001	POT001	POT001	POT001
KNOB FOR THE POT	KNOB001	KNOB001	KNOB001	KNOB001
OVERCURRENT PROTECTION PCB	PCB-OC-315	PCB-OC-400	PCB-OC-500	PCB-OC-630
MAIN TRANSFORMER	MTRX001	MTRX002	MTRX003	MTRX004
FAN CAPACITOR	CAP05	CAP05	CAP05	CAP05
TWO POLE SWITCH FOR PANEL/REMOTE & V/A	PSW001	PSW001	PSW001	PSW001
OUT PUT CONNECTOR MACHINE SIDE	FST-PLG-F-01	FST-PLG-F-01	OUT-CON-01	OUT-CON-01
OUT PUT CONNECTOR CABLE SIDE	FST-PLG-M-01	FST-PLG-M-01	NA	NA
7 PIN CONNECTOR MALE	CON7PNM	CON7PNM	CON7PNM	CON7PNM